RAPID RESEARCH AND DEVELOPMENT

The Operational Commander's Ultimate Smart Weapon

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Hog Butcher for the World,
Tool Maker, Stacker of Wheat,
Player with Railroads and the
Nation's Freight Handler;
Stormy, husky, brawling,
City of the Big Shoulders.
Carl Sandburg, "Chicago"

In the 20th century, America's place in the world has become Carl Sandburg's vision of Chicago. America's technology and industrial strength perform all the odious tasks the modern world requires to survive. The United States is the only remaining super power in a world requiring stability and safety. One of the primary reasons America has attained this status is our defense industry and its proclivity to produce vast quantities of high-quality weapons. We have the ability and capacity to produce these weapons not only for our defense, but for our allies as well.

Sikorsky used 38 draftsmen and 6 months to create drawings of the Super Stallion contours; the Comanche took one person one month on a CAD/CAM system.

The World War I *entente* could not have survived, let alone won the war, without the U.S. industrial might. In World War II (WW II), our industrial alacrity again supported our allies and changed the course of the war. After WW II, our industrial base remained the largest in the world and allows America to enjoy the world's highest standard of living. Our weapons are the benchmark for the world's defense programs.

The well-deserved reputation of our weapons is a direct reflection of the technological supremacy of our military-industrial complex. This technology and industrial base is as crucial to our nation's defense as any other facet of our nation's power. Unlike other elements of national power, it is not used in a manner efficient enough to allow its employment by operational commanders to influence the outcome of conflicts.

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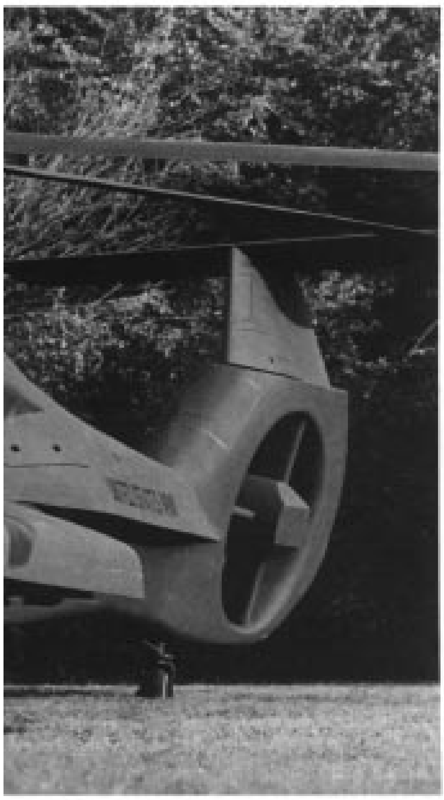
It is commonly held that all future mid- to low-level intensity conflicts will be "come as you are" operations. This mind-set holds that the short duration of these wars will preclude the redirection of our industrial and technological complex to affect directly the outcome of the conflicts. I reject this hypothesis and assert instead that our technological superiority can be focused quickly to save lives and achieve victory in future conflicts. In fact, my premise is that our rapid research and development (R&D) capacity is the operational commander's *ultimate* "smart weapon."



This article will discuss first the operational level commander's need for this rapid R&D capability and why it is not formally available today. Secondly, the inherent capability for our industrial base to adapt and respond rapidly to new requirements will be addressed. We will then investigate some examples where the industrial power of our nation was focused quickly outside of accepted channels, to solve problems operational commanders faced.

Finally, we will look at some innovative measures taken by the U.S. Air Force to support Desert Shield/Desert Storm and recommend improvements to those procedures. I'll conclude with recommended changes to the staffs of the Commanders-in-Chief (CinCs) and discuss some of the advantages these changes will give the operational level commander.

The Need for Rapid R&D

A U.S. Navy admiral destined for international prominence in defense matters, presaging today's acquisition reform, expressed the view that, "...in trying to create a perfect acquisition system, reformers turned it from one that took three to five years to field hardware in the early 1960s into one that takes three times longer to do the same job."[1]

The acquisition system has, through overregulation and congressional micromanagement, grown into a slow-moving system unable to respond quickly to changes our operational commanders need. The existing system requires the unified and specified commanders to submit integrated priority lists to the Chairman of the Joint Chiefs of Staff (JCS). The Chairman then uses this input to review the acquisition programs pursued by the Services. This ensures the Services are supporting the "war fighting" commanders with appropriate acquisition programs. This system takes years for a new program to be started. The existing budgetary cycle is fine for the long term, but is not responsive to unforeseen requirements the CinCs may have to meet.

Unforeseen Requirements

An example of unforeseen requirements might be a crisis that emerges against an enemy that was once a staunch ally. If this occurred we wouldn't have appropriate equipment or intelligence to defeat this new threat. Another case might be an unknown capability that a traditional adversary employs against us in a conflict. Since we didn't plan for this capability we might not have suitable equipment to defeat it.

Desert Shield/Desert Storm gave us many examples of the unforeseen nature of enemy capabilities. The central command (CENTCOM) had not known that the extremely hardened command bunkers Iraq used would resist our standard munitions prior to the conflict. This need created the GBU-28 "Bunker Buster" project discussed later. Another example of unforeseen enemy capabilities is that of the French built KARI command and control system Iraq employed. It was hard to jam or exploit because it was virtually unknown before the hostilities.

The technology existed to defeat these systems, but how could the CENTCOM commander get these solutions into the field? The American way of war has always been to use technology and firepower to minimize casualties when possible. If a technological solution is feasible, it should be employed if it will minimize troop losses on the battlefield. Waiting for the next Program Objectives Memorandum cycle to submit a request and then waiting for funding and development clearly wasn't the answer for CENTCOM.

Defense Acquisition System

Even if the CENTCOM commander could put his new priorities into the defense procurement system, the system could not respond quickly enough to help shape the outcome of this crisis. The defense acquisition system takes 7-15 years to put out a product after it has been programmed into the Service's budget. This time line is not driven so much by the complexity of the research activity, but by the overregulation and micromanagement to which defense procurement is subjected.

Overregulation

The first problem, overregulation, is seen easily by comparing the amount of regulations existing in 1947 to those used in 1987. In 1947, the Armed Services Procurement Regulation (ASPR) used approximately 125 pages to define all acquisition regulations for program managers (PMs). These regulations saw us through WW II, when the U.S. defense industry was the supreme arms maker of the world. In 1987, those same regulations were two sets of volumes, the Federal Acquisition Regulations (FAR) and the Defense Acquisition Regulations (DAR), numbering more than 1,200 pages. Not content with that preponderance of regulations, the FAR and DAR receive new pages and supplements monthly.[2]

These regulations are designed to ensure the acquisition process will produce a quality product by limiting the margin for error. The sheer number and size of these requirements have vitiated the effectiveness of the regulations. All the requirements have left little flexibility for the PM to eliminate requirements not applicable and worthless testing. The bottom line is that results of PM efforts have not improved with the glut of procurement regulations.

The sheer size of these regulations encourages the contract writer (usually a lower-level civilian or junior military officer) to copy standard clauses or "boilerplate" from previous contracts, regardless of the applicability. This indiscriminate practice results in humorous episodes like requiring a flight-test program in a building modification contract.

The size of the contracts (easily numbering in hundreds of pages for a major program) makes each reviewer look at only his small portion. This parochialism produces contracts with conflicting and redundant clauses causing needless work, which increases the price of the contract. The size of the contract is a direct result of overregulation forced on the acquisition process.

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The P-80, Lockheed's turbo jet-powered fighter, was designed, built and tested in 141 days to meet the threat of the German Me-262.

Costs of Overregulation

The direct and indirect costs of overregulation (the FAR and DAR) are not trivial. A decade ago, an aircraft company president noted sadly that 27 percent of the flyaway cost of an airplane was for documentation and specifications.[3] This raises prices and extends acquisition schedules. These delays increase program cost by increasing the amount of time a workforce is on the payroll. While the costs are large, the more important issue to the operational commander is the increased time the system sits in the factory and is not deployed to the field. The increased amount of acquisition time can be attributed directly to micromanagement of defense programs by Congress.

Impacts of Micromanagement

Micromanagement by Congress slows the procurement process and increases costs just as overregulation does. As a general rule, more complicated and profuse regulations and layers of review require more time to obtain approval to perform even relatively simple tasks. Longer approval time results in robbing a program of its technical advantage and increases the overall program cost.[4]

The loss of technical advantage is a serious consideration in high-technology weapons acquisition. Norman R. Augustine, Chairman and Chief Executive Officer of Martin Marietta Corporation, a major defense contractor, notes that hardware and software development takes "slightly over eight years for the median major system — in spite of the fact that many of these systems incorporate technologies with *half-lives* of less than five years [emphasis in original]."[5] Such micromanagement forces the acquisition commands into the untenable position of fielding systems that are almost obsolete before they are integrated fully into the nation's arsenals.

In addition to micromanagement, Congress mandates competition of almost all defense business. This competition is to avoid *perceived* cost gouging by "sole-source" contractors. This cost "savings" strategy not only increases the time and government overhead required to conduct a competition in addition to the normal contracting cycle, but fails to achieve any real cost savings. As Donald Pilling states in his work on defense competition: "The evidence fails to demonstrate that procurement competition does in fact reduce program cost. Competition in the AIM-7F program actually increased costs...competition should be considered more of a cost *avoidance* measure than a *cost reduction* device [emphasis in original]."[6] If competition only keeps costs from rising, and government agencies increase in size to conduct these competitions, the net result is an increase in overall program costs.

The results of congressional over-regulation and micromanagement are virtually the same — increased program cost and extended program schedules. Both results combine to lessen the effect our technology base could have as a weapon the operational commander could use in a conflict. The increased program costs make his inputs to the Chairman of the JCS harder to meet and limit the amount of systems that can be bought by the limited military budget. The most crucial impact on the operational commander, however, is the increased development and production time. The standard development schedule, as it exists today, is unable to meet any kind of quick reaction capability required by an operational commander.

Is it only the management of our technology base that keeps it from being a viable weapon for the operational commander? Does America's industry have the agility to design and produce specialized weapons quick enough for the commander to employ? We examine the answers to these questions as we continue.

Capability to Develop and Produce New Weapons

The computer revolution seized America's research parks and industrial centers in the first skirmishes of the third industrial revolution and has been entrenched firmly ever since. America has the most modern factories and design facilities in the world. Most have been structured around the widely acclaimed Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) systems. The CAD/CAM systems are so pervasive they are "...no longer considered a luxury, the technology is a necessity...."[7] if a company wants to compete in today's business environment. This technology is so widespread even such mundane products as showerheads and car-roof racks are designed on CAD/CAM systems.

Computer-Aided Design Advantages

Industry is embracing the CAD/CAM system because it facilitates the concurrent engineering concept.[8] This concept integrates the design and production disciplines in one product team. This approach, coupled with CAD/CAM methods produces impressive gains in productivity and decreases product development time. McDonnell Douglas Helicopter predicts the number of changes required for its new commercial helicopter, the MD-900 Explorer, will be one quarter to one half of those experienced on previous projects.[9] This savings is attributed directly to the use of CAD/CAM and the concurrent engineering approach it supports.

The big payback to the operational commander is the savings in development time over traditional design processes. An example of this savings can be seen at Sikorsky Helicopters. When Sikorsky designed the CH-53E Super Stallion, it took 38 draftsmen about six months to create the drawings of the helicopter's contours. On the current RAH-66 Comanche, one person using a CAD/CAM system can complete the same task in one month.[10]

The time savings aren't limited to drawings. The CAD/CAM systems enable the engineers to model performance with software before any hardware is built. This flexibility allows them to explore more concepts before deciding on prototypes to test. Engineers now go through 20, 30 or even 50 design iterations, instead of just a few using traditional methods.[11] These additional iterations allow the design to be refined on a computer instead of during expensive, time-consuming flight test.[12]

Computer-Aided Manufacturing Advantages

While the design side of CAD/CAM has led to impressive gains, the manufacturing side has yielded spectacular gains in productivity, also. Rockwell International uses CAD/CAM technology to verify producibility. Typically, a prototype requiring eight hours of machine time can be simulated using CAD/CAM in about 20 minutes.[13] Once a part is verified it can be prototyped rapidly by another computer-aided manufacturing machine so the engineer can fit it together with existing parts to ensure it works properly before expensive, time-intensive tooling is created. The new Cubital Soldier 5600 even creates complex solid models from liquid polymers. The models can be made with any CAD/CAM system-produced design.[14] These models save huge amounts of time and money by allowing prototypes to be constructed, tested and accepted before investing in tooling.

CAD/CAM Benefits to the Operational Commander

The flexibility and agility of CAD/CAM-supported concurrent engineering can respond quickly to the combat needs of operational commanders. The system can provide a new capability or modification to an existing system. As Sikorsky President Eugene Buckley said, "an aircraft that once was developed in five or six years can now be created in two or three."[15] Managed properly, CAD/CAM provides the strategic benefit of time. Time is a weapon that can be equated with money, productivity, quality and innovation.[16] To the operational commander, this strategic benefit translates directly into troops saved and mission accomplishment.

The American industrial base has the agility required by the operational commander to produce specifically tailored weapons in the time needed, except for the encumbrance of our weapons acquisition process. If freed from our self-imposed artificial restraints, can the industry base create weapons in "real-time" for our commanders? The industry base can and has performed such feats in previous conflicts as illustrated below.

Historical Examples of Rapid R&D

The history of our wartime manufacturing is rife with examples of "crash programs" implemented to solve unique operational problems. I have selected three such programs to illustrate the ability and successfulness of the rapid R&D concept. With each example, I will summarize the operational problem that precipitated the technology solution, then give the solution and its combat results. These examples illustrate how potent a weapon the U.S. military industrial technology complex can be.

The Lockheed P-80 "Shooting Star"

In June 1943, the U.S. Army Air Force worried about encountering large numbers of the German-built Me-262 jet fighters over Europe. These fighters with their superior speed would be invincible to the existing Allied fighters and a serious threat to our bomber force. A new fighter had to be developed to defeat the Me-262.

The Army Air Force went to Lockheed for an all new turbo-jet powered fighter. One week later General H. H. "Hap" Arnold personally approved Lockheed's proposal to build this all-new aircraft in 180 days.[17] Lockheed's "Kelly" Johnson formed the now legendary "skunk works" to produce the P-80 Shooting Star. Lockheed at the time was manufacturing 17 P-38s, 4 B-17s, and a total of 28 Hudsons, Lodestars and PV-1s every day! With this huge workload there were no spare engineers for this new project. Instead, Kelly formed an *ad hoc* concurrent engineering team to develop the P-80.[18]

From such an austere start, the skunk works designed, built and completed preliminary ground tests on the first prototype XP-80 in 141 days.[19] The XP-80 was accepted and flight-tested on day 143, beating the 180-day target imposed by the Air Corps. After the successful flight, the Air Corps decided to switch to a domestically-produced General Electric engine and add more armament to the aircraft.


Official USAF photo

M-1 Abrams tanks used a painted inverted "V" to prevent fratricide.

These changes required a complete redesign. The skunk works produced this 50-percent larger variant, the XP-80A, in 132 days. The XP-80A became America's first operational tactical jet fighter. More than 6,000 were built in five different variations.[20]

The threat for which the P-80A was built didn't materialize in World War Two, but the P-80A was ready if required. The record of going from a "clean sheet of paper" to a finished, flying prototype in 143 days is impressive. This example shows what a formidable weapon America's industry can be if focused on a problem with no overregulation or micromanagement to encumber the program. On the P-80 project, only six military officers were involved and made decisions on the spot, without being required to ask higher authority.[21] This decentralized execution of acquisition authority allowed Kelly Johnson to produce America's first operational jet fighter ahead of schedule.

The GBU-28 "Bunker Buster" Munitions

During Desert Storm, it became evident to CENTCOM that the hardened Iraqi command and control bunkers could withstand the U.S. Air Force BLU-109 warhead used to destroy hardened aircraft shelters. The CENTCOM needed to destroy the crucial command nodes housed in the bunkers to save Coalition lives during the ground campaign. The CENTCOM asked the Pentagon for a weapon that would penetrate these extremely hardened, deeply buried bunkers.[22]

Engineers at Lockheed Missiles and Space Company worked with engineers in the Air Force and Army to design a bomb that could penetrate the Iraqi bunkers. They took an Army stock of 8-inch, self-propelled gun barrels, machined them larger, filled them with molten Tritonal, added a BLU-109 fuze/tail fin assembly, and a GBU-27 guidance package.[23] The entire project took 17 days to complete after project go-ahead. The result was a 4,700 pound bomb capable of penetrating 100 feet of earth or 20 feet of concrete.[24] Two GBU-28 bombs were used on Iraqi command bunkers during the war with great success. The entire project, including testing and the production of 30 weapons, cost less than $10 million.[25]

This example shows how a new weapon can be created quickly, maintain commonality with systems already in the inventory, and be employed by operators without any special training. The F-111F crews who dropped these new bombs dropped them as they would a GBU-27 laser-guided bomb. The computer guidance package modification steered the new, heavier bomb to its target.[26] The result was an exact solution to a heretofore unfulfilled operational requirement—a fully employable weapon requiring little or no retraining, developed in "real time" to meet the operational commander's mission needs.

The story of the GBU-28 is nothing short of sensational. Army and Air Force development communities teamed with the contractor, blurring the traditional roles played by each part of the military-industry team. The military-industry team functioned as only wartime exigencies allow. Art Spencer, Chief of the Air Force Explosives Lab that filled the bombs, said, "throughout the GBU-28 effort we didn't go through any red tape for any of our requests, no matter how unusual."[27]

Even though the development, testing and fielding took place in 17 days, the entire process from the time the operational commander identified his requirement and the first bomb dropped took only 6 weeks. This contrasts starkly with the 6-8 months of paperwork and the years of development and flight-testing needed to produce a similar weapon in peacetime.[28] Were any "corners" cut in this development? Was this product unsafe? Were the costs of this project out of scope with the effort and value of the project? The answer to all of these questions is an unqualified NO! The 30 GBU-28s cost a mere $10 million and remain in the inventory. Hopefully, the GBU-28 example will serve to refute the demands of Congress for stricter acquisition controls and will show that reforms are needed to eliminate some existing rules.

Not all rapid R&D programs are undertaken to overcome new or unforeseen enemy capabilities. The next example we will explore is a problem previously identified in peacetime. It was not deemed important or pressing enough to be solved until combat highlighted its importance. The burden to solve this problem fell on the operational commander who had the additional handicap of trying to solve it in the combat arena.

Anti-Fratricide Identification Devices (AFIDs)

"Friendly fire" or fratricide is as old as war. The measures used to prevent fratricide have not kept pace with modern battlefield technology. In the Persian Gulf war, antifratricide measures took the form of inverted Vs painted on the sides of vehicles, or fluorescent panel markers. Neither of these measures proved of much use on the Desert Storm high-technology battlefield. This battlefield can be characterized best as being fought beyond visual range or at night with night-vision goggles.

Fratricide was an issue before the ground offensive started; 11 Marines were killed in two separate incidents at Khafji in late January.[29] This tragedy brought the issue of fratricide to the forefront and Desert Shield/Desert Storm officials began casting about for quick technology solutions.

An American technician who read of the fratricide incidents quickly developed a device he thought could solve the problem.[30] The Army rapidly evaluated the design and helped the technician's company make more than 100 mechanical, electrical and functional design changes in the next four days. After these changes were incorporated, three different preproduction units were rushed to Marine Air Station Yuma for tests against 22 other competing systems. After three night tests, one of the AFIDs was selected for immediate production and deployment.[31] The Army shipped 395 AFID units to Desert Storm troops before hostilities ceased, a scant 19 days after the Army first learned of the AFID. Within 24 days, 3,000 units were ready for shipment. The Army eventually received 10,000 units.[32]

The AFID example shows how rapidly American industry can be mobilized to solve an operational commander's immediate problem. Unfortunately, the process was not started earlier. Out of 148 Coalition combat deaths, 35 were traced to friendly fire in 28 separate incidents during the Persian Gulf war.[33] Certainly some of these deaths could have been prevented if the military had prioritized antifratricide devices higher during peacetime requirement funding drills. Industry had the capability to solve the issue even in wartime, but was not directed to do so until too late. Is this a problem of the acquisition system, or is it a problem with the unified and specified commanders not

Official USAF photo

During Desert Storm, extremely hardened and deeply buried Iraqi bunkers were destroyed by GBU-28 "Bunker Busters" dropped by F-111F crews.

wanting to allocate scarce peacetime development priorities for a capability that is a common problem and not unique to one commander? There seem to be certain requirements that have no constituency within a Service, unified or specified command. The bill for these requirements is paid in blood by our troops during a conflict.

Desert Shield/Desert Storm Air Staff Model

As did all the Services, the Air Force tried to provide the maximum support it could to Desert Shield/Desert Storm. At the Pentagon, the Air Staff developed a "Rapid Response Process" (RRP) to respond to time-urgent Desert Shield acquisitions. This RRP was a formal process to provide new or increased capabilities to operating commands participating in Desert Shield/ Desert Storm. The Air Staff recognized that our technology base could be employed to solve unique mission requirements. More importantly, it recognized that the acquisition system in place could not respond quickly enough to deliver these needed capabilities. Therefore, the RRP was created to circumvent the standard acquisition cycle. Creators of the RRP included language in the charter that prevented commands from abusing this vehicle to develop projects not needed for the conflict. (This reveals how flawed the acquisition system had become.)

Rapid Response Process

The RRP system consisted of four basic steps. The first step was the development and coordination by CENTCOM, of a Combat-Mission Need Statement(C-MNS). This statement validated requirements derived from Desert Shield/Desert Storm mission needs. The second step involved an action-officer-level feasibility assessment at the Pentagon. This feasibility assessment reviewed mission needs, technical feasibility, and alternative solutions, and selected the best alternative to recommend to the General Officer Steering Committee (GOSC). This recommended approach then would be briefed at the third step, which was a decision briefing to the GOSC. This committee of Air Staff General Officers would then decide whether or not the project should be approved. If approved, the project would proceed directly to the Vice Chief of Staff of the Air Force(AF/CV). This briefing to the AF/CV was the fourth step, and, if approved, the project would be undertaken immediately by the cognizant directorate. This entire RRP process would take place within 15 days of the need identification by the using command.[34]

Photo courtesy of Test Systems, Inc.

Only 19 days after the Army learned of AFIDs, 395 were shipped to Desert Storm troops to reduce "friendly fire." The Army eventually received 10,000 units.

Results of the RRP

The RRP was crucial in identifying and fielding many critical capabilities required by our forces. The RRP saw 35 projects submitted, 33 approved, and 23 fielded (or at least partially fielded) before the end of hostilities. Some of these successes were as trivial as an immediate acquisition of Global Positioning System (GPS) receivers for C-130 transports, to highly classified projects pushing the limits of new technology. In the latter case, the GBU-28 Bunker Buster was one of these projects that was highly classified at the time, but since has been declassified.[35] All of these projects focused the strength of America's technology and industrial base on the operational commander's problems. Finally, a formalized process existed for the Air Force to meet operational needs in a real-time manner. The operational commander at last had a way to harness the U.S. industrial base to affect the outcome of a conflict.

Lessons learned from the war point out just how successful our high-technology weapons were in limiting our casualties and enhancing our chances for victory. As one victory assessment said, "A fundamental message appears to be the importance of superior technology. Advanced weapon systems provided the U.S. with a clear-cut advantage over Iraq, a nation which itself was equipped with some very modern Western systems."[36]

Without the RRP, many capabilities needed by our forces could not have been fielded quickly enough to have seen action in this conflict. The RRP contributed significantly to the technologically superior capabilities fielded by the Air Force in Desert Shield/Desert Storm and would serve well as a model for all Services to adopt in future conflicts.

Suggested Improvements for CinC Staffs

As reiterated throughout this article, the goal of the following improvements would be to allow the operational commander to use America's industrial base as a weapon to end conflicts favorably. This could be done by adding a collateral function to the J-8 requirements branches of the unified and specified command staffs. This collateral function would consolidate command requirements for new capabilities needed during conflicts and pass them on to the appropriate Service for action.

The J-8 staff is in the unique position of being in the theater at the decision-making headquarters during the conflict. This perspective gives the J-8 the insight required to prioritize and issue requirements to the acquisition communities of each Service. The J-8 already has the peacetime requirements mission, understands the acquisition process, and has a working knowledge of the technology available.

An additional adjunct to assist the J-8 staff could be a deployed "Tiger Team" cell of acquisition officers. This cell would be made up of acquisition officers from each Service to assist in creating the C-MNS, to advise on technical feasibility, and suggest alternatives at the point of inception. They would play a valuable role in implementing the technology once the new capabilities were developed and delivered. Their role would cover the spectrum of acquisition support from special logistics needs to specialized training.

Formalizing the RRP

Formalizing this rapid reaction process before a conflict occurs, allows the operational level commander to be aware of its existence and be familiar with its use in times of crisis. Formalizing the process will, by its very nature, make it a joint capability. During Desert Shield/Desert Storm, only the Air Force had such a process. If the other Services had been included, the Army might have fielded the AFIDs prior to the ground war. This formalization ensures each Service will be able to focus their uniquely specialized technology centers on the operational commanders' problems.

The joint aspect of the process will also negate some of the redundancy in acquisition activities seen during the war. Complimentary capability might be desired in some cases, but not when trying to allocate scarce R&D assets such as time, technical expertise and manufacturing capability. Services could end up competing among themselves, increasing not only prices, but time required to produce items. Having the J-8 as the central controlling and directing agency for these rapid acquisitions can resolve such conflicts. This centralized direction, and decentralized execution gives the commander a single point of contact for such a development capability and, therefore, increases his productivity.

The concept of adding the collateral function to the J-8 staff's already full slate of duties is a sound one. However, quoting H. Ross Perot, "The devil is in the details" of a plan. The last thing needed in the acquisition community is another bureaucratic procedure to slow the development process further. A straightforward, common-sense approach to this new process would be the most beneficial and efficient.

This approach would center around the existing acquisition process. The J-8 staff prepares the command's integrated priority list input for the Chairman of the JCS. This requires the J-8 to understand the acquisition process and know the Service players that will develop the systems. This knowledge will enable the J-8 to form a review board to replace the GOSC in the Air Staff example.

Once they identify projects to be funded, they should be passed on to the Service designated to execute the program. That Service then would have to fund the program out of its already appropriated funds. The designated Service would have to sacrifice some existing program and hope to recoup this loss in future budgeting actions. This was done by the Air Force in Desert Storm without adverse effects. The Chairman of the JCS will have to be cognizant of the process and influence Services to share the pain.

A Common-Sense Definition

The size and scope of the projects again should be defined by a common-sense approach. The process is not meant to violate the intent of acquisition regulations, but only to provide for wartime emergency actions. The projects considered for this process should be able to be employed in the current conflict. The greatest portion of the candidate projects should be modifications to existing systems. Modifications minimize development costs, impact to logistical and training infrastructure, and provide the best hope of employing the new capability as soon as possible.

The operational commander would have the power to form a rapid R&D team if authorized by the Secretary of Defense during a conflict. This designation would not be automatic but, like activating the Civil Reserve Air Fleet (CRAF), would take a formal declaration by the Secretary. This formalization would assuage the fears of Congress that the RRP was an attempt to usurp their powers to control the armed forces procurement actions.

The process proposed in this article is not perfect. It provides an intellectual jumping-off point for further discussion and compromises. The crux of the concept is to enable the operational commander to employ America's limitless industrial potential as an operational weapon. The process outlined does not integrate into the existing acquisition process but, instead, supplements it. This supplement fills the acquisition void the operational commander has with the existing process. The proposed process gives the operational commander the power to call out the forces of American industry to answer the tocsin of war. This process allows the operational commander to bring all the resources of national power to bear on resolving conflicts.

Conclusion

Industrial and technological superiority is America's greatest peacetime asset and is capable of playing a larger role in conflict resolution. The conundrum is to focus this potentially decisive force to meet operational requirements that arise during conflicts. Furthermore these needs must be met in real time for them to be effective.

The defense acquisition system as it exists today does not do an efficient job of meeting requirements without a time constraint. This inefficiency is due to many factors, but most agree that congressional micromanagement and overregulation are the biggest contributors. The specified and unified commands have a well-defined but small role in setting priorities in today's acquisition system.

In contrast to the inefficiency of the acquisition system, the development and production capabilities are increasing, spurred by new CAD/CAM systems. Industry's capability to develop and produce weapons in real time far outstrips the procedural ability of the military to procure them.

Examples from the last 50 years show how effective American industry was at meeting the challenge to produce weapons and modifications of existing weapons to counter real-time threats. These examples show that even problems left festering unsolved during peacetime could be solved rapidly if industry was focused properly.

The Air Staff example in Desert Shield/Desert Storm illustrated how the defense acquisition system could be streamlined and focused on operational problems. This example gave us a glimpse of possibilities if we reorganize the staff functions of the unified and specified commands to focus the heretofore untapped riches of our industrial capacity.

The rapid R&D capability of America is truly the ultimate smart weapon. It has almost unlimited capability and agility to solve any operational problem. It only needs the proper focusing operational commanders staffs alone possess. This is a weapon that cannot be overlooked in today's ever-shrinking defense budget environment.

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